

## Records of Two *Tripartiella* Species (Ciliophora : Peritrichida) from Freshwater Fishes in West Bengal, India

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**Abstract** During parasitological surveys in freshwater fishes in West Bengal, India, 2 species of trichodinid ectoparasites (Ciliophora, Oligohymenophora, Peritrichia) belonging to the genus *Tripartiella* were found from freshwater fishes. *Tripartiella copiosa* and *Tripartiella obtusa* were found from the same host fish *Labeo bata*. These 2 *Tripartiella* species fall within the range of morphometry and agree closely in the overall appearance of the adhesive disc with the original populations. In the present work, both *Tripartiella copiosa* and *Tripartiella obtusa* are recorded. For each *Tripartiella* species, detailed descriptions are provided based on the examinations of specimens prepared using the dry silver nitrate impregnation in the present study.

**Keywords** *Tripartiella* spp., Freshwater fish, *Labeo bata*, West Bengal, India.

### Introduction

Trichodinids are a widely distributed group of ciliate ectoparasites from the family Trichodinidae Claus 1874. Among the 10 genera within family Trichodinidae Claus 1874, the genus *Tripartiella* Lom 1959 is seldom reported. Up to now, representatives of this genus are nearly gill parasites of marine and freshwater fishes with less than 20 known species worldwide (Lom 1959, 1963, Hoffman and Lom 1967, Lom and Haldar 1977). In India, most studies on diversity of trichodinid ciliophorans focused on the genus *Trichodina* (Mitra and Haldar 2005, Mitra and Bandyopadhyay 2006a, b, 2009, Mitra et al. 2012a, b, 2013). So, as part of systematic studies on trichodinids of freshwater fishes in this area, the present paper investigates 2 freshwater ectoparasitic trichodinids belonging to the genus *Tripartiella* Lom 1959.

### Materials and Methods

Host fishes were collected from the local fish market in Ranaghat of West Bengal in the year 2017—2018. Gill and skin smears were made on grease free slides. Slides containing trichodinid ciliophorans were impregnated using Klein's dry silver impregnation technique (Klein 1958). Examinations of prepared slides were made under an Olympus research microscope (Model CH 20i) at 1000X magnification with an oil immersion lens and photographs were taken with an Olympus digital camera. All measurements are in

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micrometers and follow the uniform specific characteristics as proposed by Lom (1958), Wellborn (1967), Arthur and Lom (1984). In each case minimum and maximum values are given, followed in parentheses by arithmetic mean and standard deviation. In the case of denticles and radial pins, the mode is given instead of the arithmetic mean. The span of the denticle is measured from the tip of the blade to the tip of the ray. Body diameter is measured as the adhesive disc plus border membrane. The description of denticle elements follows the guidelines of Van As and Basson (1989). Sequence and method of the description of denticle elements follows the recommendations of Van As and Basson (1992).

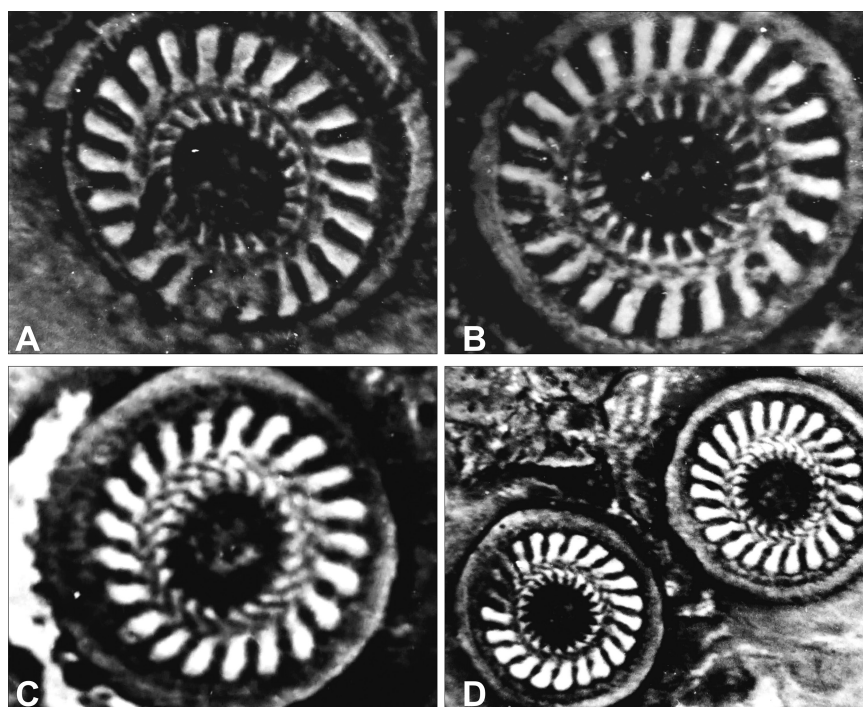
### Results and Discussion

Subclass Peritrichia Stein, 1859  
Order Mobilida Kahl 1933  
Family Trichodinidae Claus 1874  
Genus *Tripartiella* Lom 1959

#### *Tripartiella copiosa* Lom 1959 (Figs. 1. A–B)

##### Description :

The following morphological description was based on 25 specimens measured (n=25). This is a small sized ciliophoran with a disc shaped body 14.1-21.65 ( $18.6 \pm 1.1$ ). The adhesive disc 12.6-18.9 ( $16.7 \pm 2.1$ ) of this ciliophoran is surrounded by a finely striated border membrane 1.5.2.1 ( $1.7 \pm 1.4$ ). The center of this disc 3.1-5.9 ( $5.0 \pm 2.6$ ) is finely granular and uniformly dark when impregnated with silver. The denticulate ring consists of 21–24 ( $22 \pm 1.1$ ) small denticles. Length of blade 3.0-4.2 ( $3.5 \pm 1.3$ ), length of ray 0.6-1.9 ( $1.0 \pm 0.3$ ), width of central part 0.4–1.0 ( $0.5 \pm 0.6$ ). Span of denticle 4.1–5.9 ( $5.0 \pm 0.7$ ), length of denticle 0.5–2.1 ( $2.1 \pm 0.9$ ). The blade of denticle is broad, fills half of the space between y-axis and obliquely directed backwards. The distal margin in most cases is truncated, adjoins and runs parallel to



**Figs. 1.** A-D. Sliver impregnate adhesive discs of *Tripartiella* spp. Lom 1959. A-B. *Tripartiella copiosa* Lom 1959. C-D. *Tripartiella obtusa* Ergens and Lom 1970.

border membrane. The lateral margins of blade are parallel. The anterior margin is almost parallel to y +1 axis and constricts at the anterior projection. The posterior margin also has the same course and adheres to y-1 axis throughout its length. The tangent point is flat, forms a line with y-axes. The anterior projection is prominent, but is a delicate spike-like extension. The blade is connected to anterior projection by a delicate section. The posterior projection is also prominent and touches the section between blade and anterior projection by its tip. The lateral projection fits well into the well-developed notch at the denticle. The section between anterior projection and central part is delicate, standing center. The central part is delicate. The ray is thin, slanted posteriorly and terminating rounded point. There are 3—4 ( $3.6 \pm 0.5$ ) radial per denticle.

Remarks :

*Triptiella copiosa* is the type species of the genus *Triptiella*. It was first described by Lom (1959) as *Trichodinella (Tripartiella) copiosa* from the gills of *Rhodeus sericeus* in Czechoslovakia. In 1963, the same author described the ciliophoran as *Triptiella copiosa* Lom 1959. He recorded the ciliates in addition to *R. sericeus*, many other host fish, viz., *Rutilus rutilus*, *Alburnus alburnus*, *Leuciscus leuciscus*, *Blicca björkna*, *Lenuiseus cephalus*, *L. delineatus* and *Cobitis taenia* for this ciliophoran in Czechoslovakia. Lom and Haldar (1977) contributed in characterizing *T. copiosa* as the ciliophoran of the genus *Triptiella* which possesses denticles with the anterior projection on the blade in form of a sharp spike. Based on this unique feature as well as blade shape as mentioned by Lom (1959) in having the blade, with parallel lateral margins, obliquely directed backward and attached to the anterior projection through its stem-like narrow basal part, the ciliophoran is quite identical. During the period of present investigation *T. copiosa* was collected from the gills of *Labeo bata* Hamilton 1822 in West Bengal.

***Triptiella obtusa* Ergens and Lom 1970  
(Figs. 1. C-D)**

Description :

The following morphological description was

based on 25 specimens measured (n=25). Small to medium freshwater *Triptiella* with a compressed body, diameter 20.5–29.5 ( $24.6 \pm 1.7$ ), adhesive disc 17.2–22.9 ( $20.8 \pm 0.9$ ), width of border membrane 1.5–3.0 ( $2.0 \pm 0.4$ ), diameter of denticle ring 10.5–12.9 ( $12.1 \pm 0.9$ ), number of denticles 21–24, number of radial pins per denticle usually 4–5, span of denticle 5.3–7.9 ( $6.9 \pm 0.8$ ), length of denticle 2.4–3.9 ( $3.1 \pm 0.2$ ), blade length 2.7–4.1 ( $3.2 \pm 0.5$ ), generally elongated and slanted obliquely backwards; distal blade surface straight, in parallel to border membrane and a little higher than the sharp tangent point; anterior and posterior surfaces straight, but not in parallel with each other with anterior surface blade apophysis present, prominent just touching the y +1 axis; blade apophysis absent or invisible. Central part relatively developed with a sharp point fitting loosely into preceding denticle and far away from the y-1 axis. Shapes of the central part above and below the X-axis not symmetrical. Ray connection inconspicuous and barely distinguishable from the ray. Ray relatively long when compared to other *Triptiella* species and tip of ray directed slightly forward; ray apophysis absent and length of ray was 1.4–2.3 ( $1.8 \pm 0.4$ ); ratio between denticle above and below X-axis less than two. Macronucleus U-shaped, external diameter 16.4–24.1 ( $18.9 \pm 1.3$ ) and internal diameter 12.1 – 18.6 ( $14.9 \pm 1.7$ ). Adoral ciliary spiral turns about 180° – 230° around peristomial disc.

Remarks :

In 1970, *Triptiella obtusa* was originally found from gills of *Gobio gobio* by Ergens and Lom, the Czechoslovakia scientists (Ergens and Lom 1970). Later, it was found regularly but exclusively on the gills of the same host from Czechoslovakia by Lom and Haldar (1977). In terms of body size, it is very close to *Triptiella copiosa* Lom 1959, but these 2 species can be easily distinguished by the morphological features of the denticles, especially the shape of denticles (Lom 1959). The morphology and morphometric data of the present population from the gills of *Labeo bata* are well within the range of the original description by Lom and Haldar (1977). This finding has established a new host record, *Labeo bata* Hamilton 1822 for *Triptiella obtusa*, which extends the known host and geographic range for *Triptiella obtusa*.

## References

- Arthur JR, Lom J (1984) Trichodinid Protozoa (Ciliophora : Peritrichida) from freshwater fishes of Rybinsk Reservoir, USSR. *J Protozool* 31 : 82–91.
- Ergens R, Lom J (1970) *Puvodci parazitornich nemoci ryb*. Prague, Academia, pp 383.
- Hoffman GL, Lom J (1967) Observations on *Tripartiella bursiformis*, *Trichodina nigra* and a pathogenic trichodinid, *Trichodina fultoni*. *Bull Wild Dis Asso* 3 : 156–159.
- Klein BM (1958) The dry silver method and its proper use. *J Protozool* 5 : 99–103.
- Lom J (1958) A contribution to the systematics and morphology of endoparasitic trichodinids from amphibians with proposal of uniform specific characteristics. *J Protozool* 5 : 251–263.
- Lom J (1959) On the systematics of the genus *Trichodinella* Sramek-Husek (= *Brachyspira* Raabe). *Acta Parasitol* 7 : 573–590.
- Lom J (1963) The ciliates of the family Urceolariidae inhabiting gills of fishes (the trichodinella-group). *Vestnik Československe Spolecnosti Zoologicke* 27 : 7–19.
- Lom J, Haldar DP (1977) Ciliates of the genera *Trichodinella*, *Tripartiella* and *Paratrachodina* (Peritricha, Mobilina) invading fish gills. *Folia Parasitol* 24 : 193–210.
- Mitra AK, Bandyopadhyay PK (2006a) First records of Ectoparasitic African Trichodinids (Ciliophora : Peritrichida) in a Cichlid fish *Oreochromis mossambicus* (Peters 1852) from the Churni River System, West Bengal, India. *Anim Biol* 56 (3) : 323–333.
- Mitra AK, Bandyopadhyay PK (2006b) *Trichodina haldari* n. sp. and *Paratrachodina bassonae* n.sp. (Ciliophora : Peritrichida) from Indian freshwater fishes. *Acta Protozool* 45 : 289–294.
- Mitra AK, Bandyopadhyay PK (2009) *Dipartiella kazubski* sp. nov. (Ciliophora : Peritrichida), a new ectoparasitic trichodinid species from the gills of freshwater fishes in India. *Protistology* 6 (1) : 33–38.
- Mitra AK, Bandyopadhyay PK, Gong Y, Bhowmik B (2012a) Occurrence of Trichodinid Ciliophorans (Ciliophora : Peritrichida) in the freshwater fishes of river Churni with description of *Trichodina glossogobae* sp. nov. in West Bengal, India. *J Parasit Dis* 36 (1) : 34–43.
- Mitra AK, Bandyopadhyay PK, Gong Y, Goswami M, Bhowmik B (2012b) Description of 2 new species of ectoparasitic *Trichodina* Ehrenberg, 1830 (Ciliophora : Trichodinidae) from freshwater fishes in the river Ganges, India. *J Parasit Dis*. doi : 10.1007/s12639-012-0126-z.
- Mitra AK, Bandyopadhyay PK, Gong Y (2013) Studies on Trichodinid and Chilodonellid Ciliophorans (Protozoa : Ciliophora) in the Indian freshwater and estuarine fishes with description of *Trichodinella sunderbanensis* sp. nov. and *Trichodina nondusi* sp. nov. *Parasitol Res* 112 : 1077–1085. doi.10.1007/s00436-012-3234-x.
- Mitra AK, Haldar DP (2005) Descriptions of 2 new species of the genus *Trichodina* Ehrenberg, 1838 (Protozoa : Ciliophora : Peritrichida) from Indian freshwater fishes. *Acta Protozool* 44 : 159–165.
- Van As JG, Basson L (1989) A further contribution to the taxonomy of Trichodinidae (Ciliophora : Peritrichida) and a review of the taxonomic status of some ectoparasitic trichodinids. *Syst Parasitol* 14 : 157–179.
- Van As JG, Basson L (1992) Trichodinid ectoparasites (Ciliophora : Peritrichida) of freshwater fishes of the Zambesi River System, with a reappraisal of host specificity. *Syst Parasitol* 22 : 81–109.
- Wellborn TL JR (1967) *Trichodina* (Ciliata : Urceolariidae) of freshwater fishes of the southeastern United States. *J Protozool* 14 : 399–412.